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DETERMINANTS OF THE INDONESIA'S CURRENT ACCOUNT BALANCE: AN ERROR CORRECTION MODEL APPROACH

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Abstract. This study aims to investigate the relationship between exchange rate, Domestic Money Supply (M2), real Gross Domestic Product (GDP), and Foreign Direct Investment (FDI) on Indonesia's current account balance (CAB) in the short and long term. For the purpose of this study, the Error Correction Model (ECM) is used. It uses data during the period 2000-2017. The result showed that (a) M2, real GDP, and FDI in the short-term have not significant effect on Indonesia's current account but exchange rate has a significant negative effect; (b) in the long-term exchange rate, M2, and real GDP have not significant effect on Indonesia's CAB, while FDI has a negative significant effect on Indonesia's CAB. Policy recommendation for government as an implication of this study (a) stabilize the exchange rate in order to decrease current account deficit (CAD); (b) improve the investment climate and issue incentive policies for local investor; (c) increase the competitiveness of export-oriented products and reduce dependence on imports.

Keywords: Exchange rate; Domestic Money Supply; real GDP; Foreign Direct Investment; Indonesia's Current Account

1. Introduction

Indonesia, as a developing country, has a chronic problem that has yet to be resolved (Sasongko et al., 2019), namely the current account deficit (CAD). The CAD is a condition when the value of import of goods and services of a country is higher than its exports. This condition indicates that the performance of domestic industries has not been able to compete with other countries. Although the industrial sector is predicted becomes the dominant sector for Indonesia's foreign exchange earnings. The problem of CAD becomes a very important duty for government to immediately obtain a solution so that the performance of Indonesia's national economy gets better. A current account surplus condition is evidence of the strength of a country in establishing economic cooperation with other countries and representing a strong condition of competitiveness in trading on global market.

Based on Figure 1, the Indonesia's current account balance during the period 2000-2017 described fluctuating conditions. Indonesia's current account balance in the 2000-2011 is still in a surplus position. It can be shown by

the value of current account balance (CAB) in 2000 was still a surplus of 7,992 million US dollars, then it dropped very significantly to 4,068 million US dollars in 2004, then it declined again to 126 million US dollars in 2008, and in 2011 CAB at the position of 1,685 million US dollars. The period of 2012-2017 was the position of current account deficit (CAD) with a value of -24.418 million US dollars then it declined again in 2014 to -27,510 million US dollars and in 2017 it reached -16,196 million US dollars.
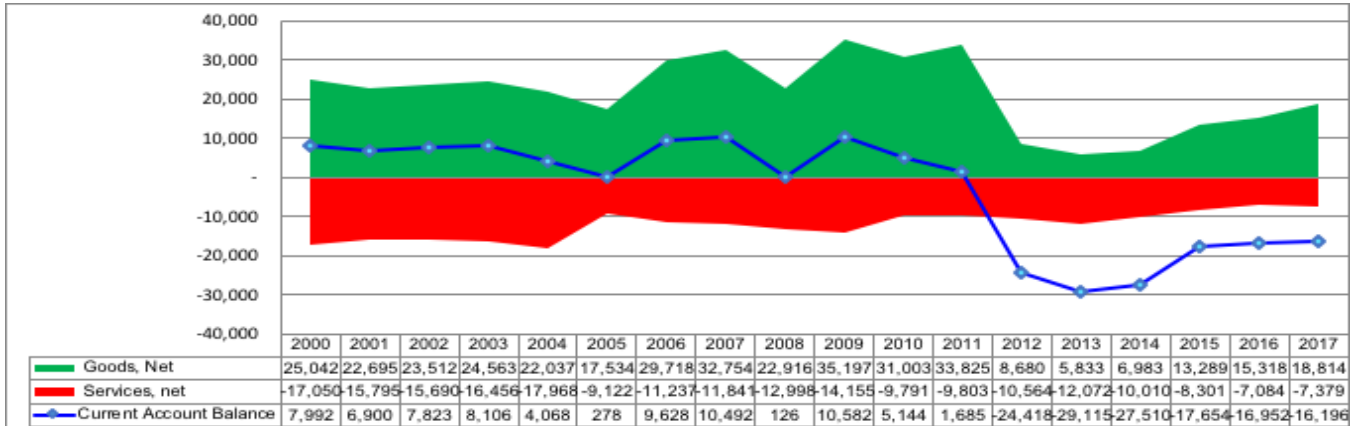

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Goods, Net	25,042	22,695	23,512	24,563	22,037	17,534	29,718	32,754	22,916	35,197	31,003	33,825	8,680	5,833	6,983	13,289	15,318	18,814
Services, net	-17,050	-15,795	-15,690	-16,456	-17,968	-9,122	-11,237	-11,841	-12,998	-14,155	-9,791	-9,803	-10,564	-12,072	-10,010	-8,301	-7,084	-7,379
Current Account Balance	7,992	6,900	7,823	8,106	4,068	278	9,628	10,492	126	10,582	5,144	1,685	-24,418	-29,115	-27,510	-17,654	-16,952	-16,196

Figure 1. Indonesia's Goods Account, Services Account and Current Account Balance 2000-2017 (Million US Dollars)
Source: Central Bureau of Statistics of Indonesia

Indonesia's CAD conditions starting in 2012-2017 are caused by several things, they are (a) a decline in the surplus in Indonesia's trade balance as a result of declining exports and/or increased imports of goods; (b) There are deficits in Indonesia's services accounts; and (c) there is a deficit in Indonesia's net income.
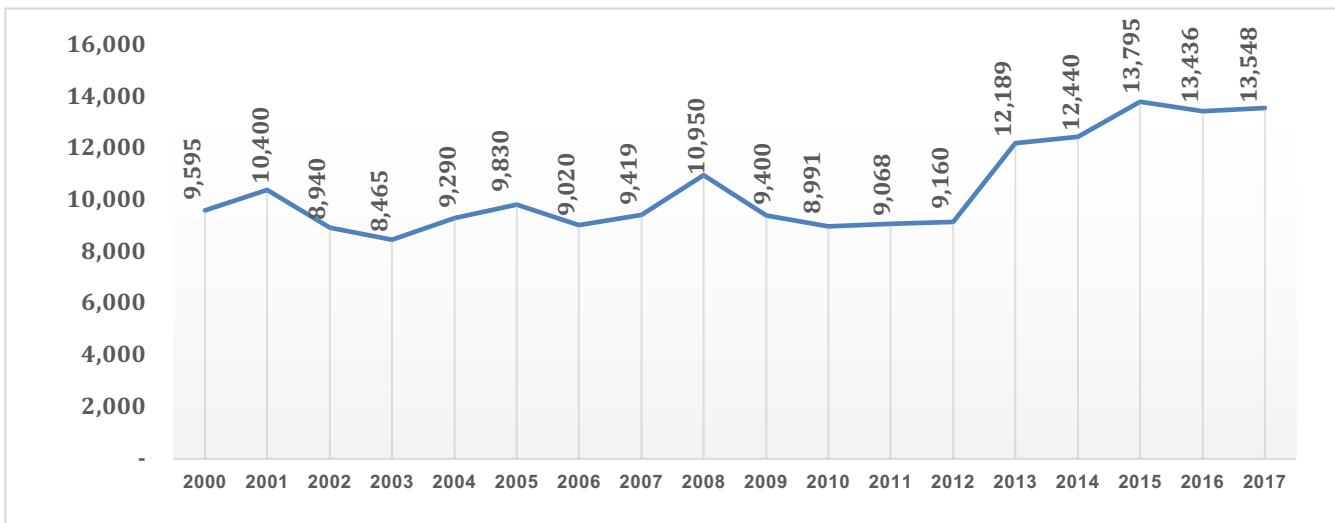

Figure 2. Exchange Rate US Dollar in Indonesia 2000-2017 (IDR)
Source: Central Bureau of Statistics of Indonesia

The condition of the US dollar exchange rate against IDR during the period 2000-2017 has fluctuated with an upward trend. Look at Figure 2, it can be seen in 2000 the US dollar exchange rate to IDR was 9,595, then it increased to 9,830 IDR in 2005, it rose again to 10,950 IDR in 2008, then it reached 12,189 IDR in 2014 and in 2017 it was 13,548 IDR. This increase in the exchange rate of the US dollar against IDR is thought to be a factor that worsened the condition of CAD Indonesia. This is in line with the results of research from several researchers

such as Wanjau (2014), and Bogdan, Cota and Erjavec (2017). They prove that the increase in the exchange rate has a negative influence on current account.

M2 is a domestic money supply that includes narrow money plus savings and time deposits that serve as a supply of money in the economy. The dispersion of M2 in Indonesia during the period 2000-2017 shows a trend that tends to increase. Figure 3 shows that M2 values were still at 747.03 quintillion IDR in 2000, then in 2004 it reached 1,033.53 quintillion IDR, it rose again to 1,883.85 quintillion IDR in 2008, then in 2013 it increased again to 3,737.70 quintillion IDR and it was 5,419.00 quintillion IDR in 2017.
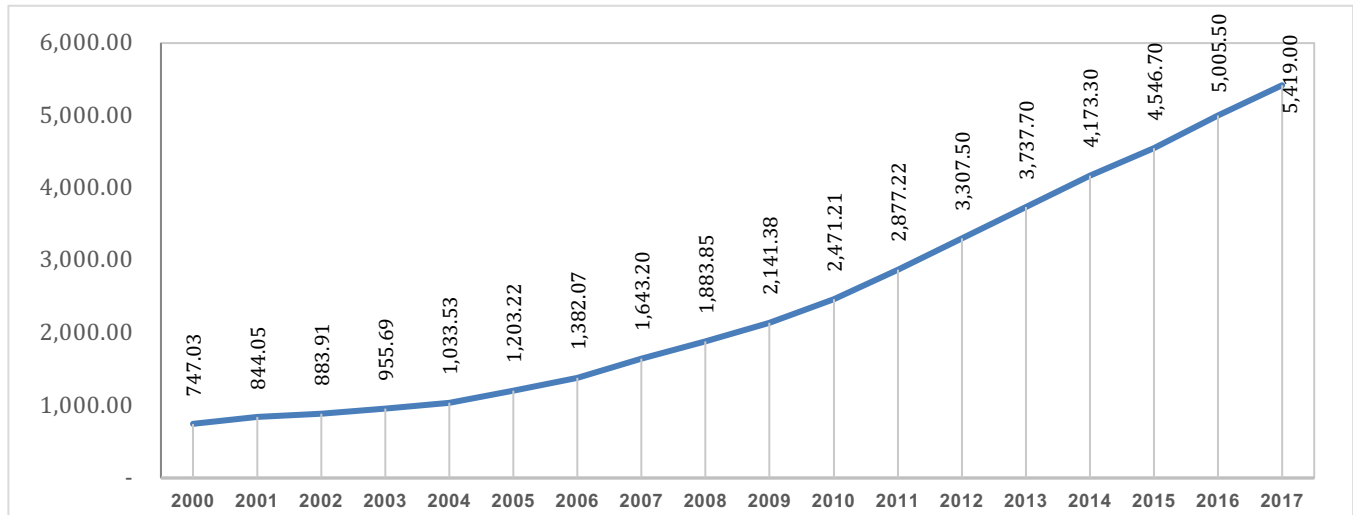

Figure 3. M2 Indonesia 2000-2017 (Quintillion IDR)
Source: Central Bureau of Statistics of Indonesia

The growth of the large M2 increase is interesting to prove whether M2 has a significant effect on Indonesia's current acoount balance (CAB). The thought arose in researchers' mind, considering the composition of M2 consisting of narrow money, deposits and savings that had different levels of liquidity, so the effectiveness of M2 in affecting economic activities that had an impact on CAB in Indonesia was important to study. Some of the results of the study show that M2 has a significant positive effect on CAB as the findings of a study by Danmola and Olateju (2013); Dejeufosse (2015); and Arize, Kallianiotis, Malindretos, Panayides and Tsacanas (2018).

Figure 4 illustrates the growth of real GDP conditions in Indonesia during the period 2000-2017 which tends to increase significantly. Theoretically, the condition of real GDP explains the economic performance of a country that will support the development of trade between countries. In 2000 the value of real GDP was 4,121,726 billion IDR, then in 2004 it was 4,912,834 billion IDR, it rose again to 6,176,068 billion IDR in 2008, then in 2012 it rose to 7,727.083 billion IDR and it reached 9,912,749 billion IDR in 2017. It needs to be proven whether the increase in Indonesia's economic performance reflected by the increase in real GDP has positively affected CAB Indonesia or not during the period 2000-2017. Whether that Indonesia's condition is in accordance with the results of previous studies in several countries such as the findings of a study by Roy (2012) and Eldemerdash, Metcalf and Maioli (2014) which proved that the real GDP of the countries in their study has a positive effect on the current account.
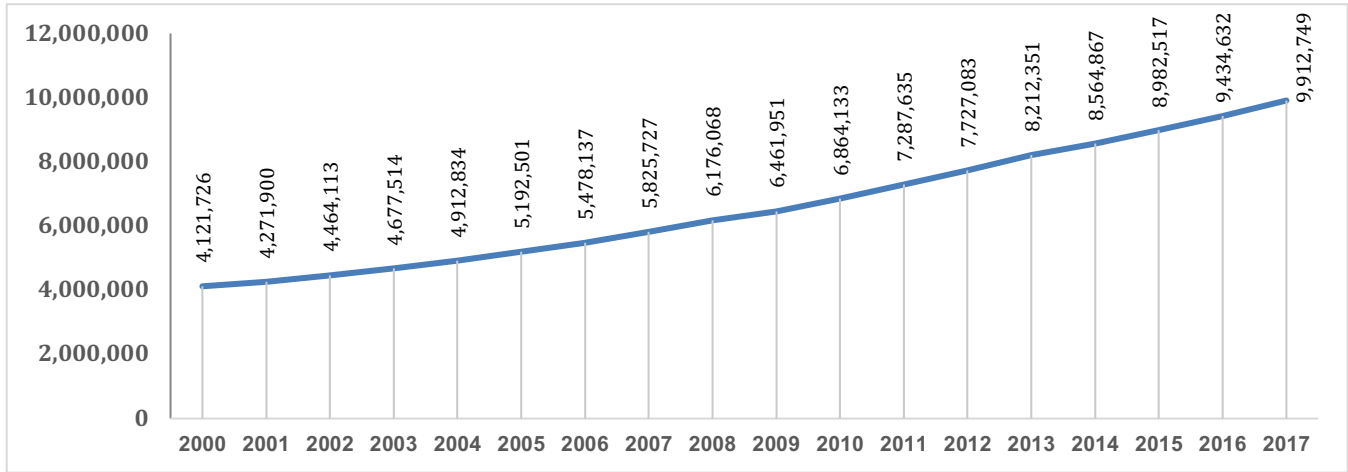
Figure 4. Real GDP Indonesia 2000-2017 (Billion IDR)
Source: Central Bureau of Statistics of Indonesia

Figure 5 shows that the value of FDI in Indonesia during the period 2000-2017 is fluctuated tend to rise. In the period 2000-2006 described that FDI in Indonesia tended to decline. The value of FDI was still at 15,420.00 million US dollars in 2000 and it dropped significantly to 5,977.00 million US dollars in 2006. While in the period 2007-2017 the value of FDI in Indonesia tended to rise. In 2007 the value of FDI was still at the level of 10,341.40 million US dollars, then it rose to 19,474.50 billion US dollars in 2011, it increased again to 28,617.50 million US dollars in 2013 and in 2017 it reached 32,239.80 million US dollars.
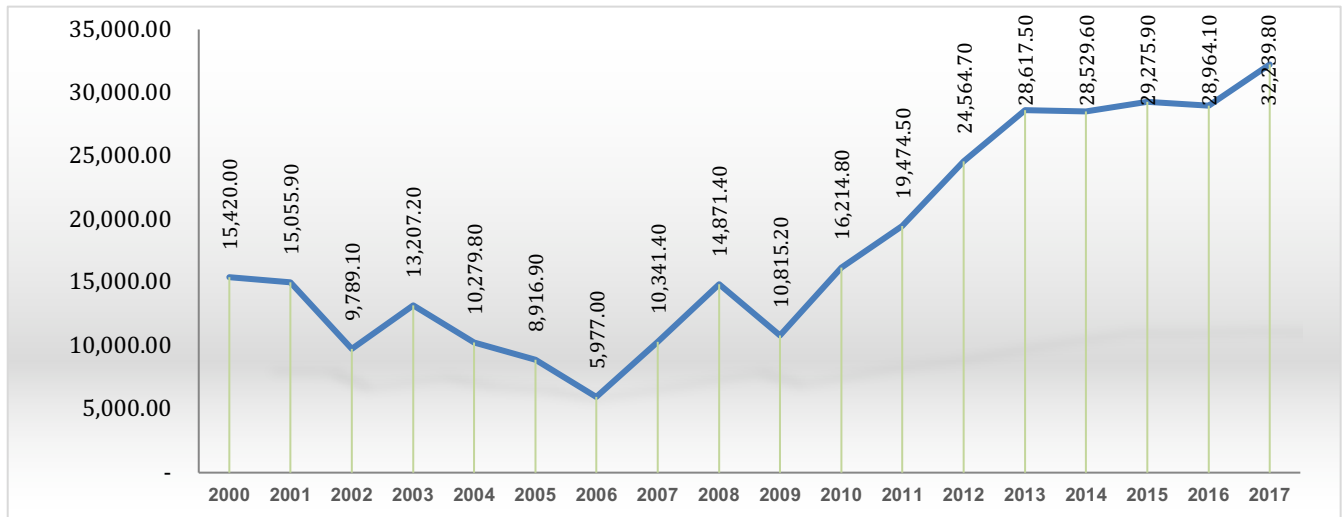

Figure 5. FDI in Indonesia 2000-2017 (Million US Dollars)
Source: Central Bureau of Statistics of Indonesia

The novelty of this study is, first, the research in this section focuses on various problem that are not mentioned in previous study. For example, research by Erdem, Ucler and Bulut (2014) in 15 countries of the OECD members only discuss domestic credit and real exchange rate. Meanwhile Eldemerdash, Metcalf and Maioli (2014) examine gross investment, gross saving and fiscal balance and its effect on CAD. Second, this study uses a particular research methodology ECM (Error Correction Model) analysis. This method is not used in the previous literature. Therefore, this study will focus on four variables (exchange rate, M2, real GDP and FDI) and use the methodology that previously mentioned to respond to research gaps in earlier studies.

2. Literature Review

2.1. Exchange Rate
Insel and Kayikci (2013) have researched the current account balance and the macroeconomic factors that affect it. This study was conducted in Turkey using data from 1987-2009 and autoregressive distributed lag as its research method. The macroeconomic variables in this study are inflation, GDP, trade openness, oil price, and real exchange rate. One of the results indicates exchange rate is able to give a negative significant effect on the current account balance. The researchers assume that the exchange rate has a negative impact on the current account balance through the factor of forming the prices of tradable goods.

A study by Erdem, Ucler and Bulut (2014) also discuss the relationship between domestic credit and real exchange rates on the current account balance. This study was conducted in 15 countries of the OECD members during the period 1986-2010 using the autoregressive distributed lag method. The results show the exchange rate variable has a significant negative effect in long-term on the current account balance. However the negative effect did not occur in short-term, then the researchers also added the J-curve effect in the model does not exist.

Wanjau (2014) has investigated a study about relationship between exchange rate and current account balance. This study was conducted in Kenya during the period 1980–2011 using the ECM research method, the Stationary ADF test and Phillip Perron co-integration test. The results show that the exchange rate can affect the current account (CA), the effect is in the form of a J-curve. The researcher recommends the government can define an exchange rate policy that leads to increased export demand so that the current account deficit (CAD) can be reduced and ultimately economic growth can be achieved sustainably.

Bogdan, Cota and Erjavec (2017) have examined the relationship between current account balance and export performances in new EU countries. This study was conducted in 2017 using a linear regression method by entering exchange rate as one of its independent variable. The results indicate that countries with floating exchange rates have a negative relationship with the current account balance. This study also explains that exchange rate depreciation can increase the current account balance. It is mainly due to the increasing number of exports produced. The researchers then give recommendations to the government and the next researcher to emphasize the importance of non-price competitiveness exports

2.2. Domestic Money Supply (M2)
The impact of monetary policy in order to regulate the amount of M2 in Nigeria was carried out by Danmola and Olateju (2013). The study looks for the relationship between monetary policy and current account balance, taking the 1970-2010 research periods in Nigeria. The research model uses Johansen's co-integration method, OLS and ECM. The results indicate that there is a long-term relationship between monetary policy and current account balance. It explains that monetary policy in the form of M2 increases can positively affect exports, imports and industrial output. Therefore, the authors provide recommendations to the government in the form of monetary policy setting in order to regulate the amount of money supply to establish a good industrial climate so that the industrial output gets bigger, exports also increase and in the end the current account deficit can be minimized.

Meanwhile Dejeufosse (2015) also investigates the same study about monetary policy and current account balance. His research is in the form of model proposals not in the form of empirical research so that there is no country or period of research except as an example of models, is in United State and in Japan. Through the paper, the author describes the relationship between the regulation of money supply setting and the current account balance. The results show that when the central bank determines the optimal monetary policy of interest rate, it will cause the current account disparity to be even greater because production activities are dominated by international corporations rather than domestic corporations.

Then Arize et al. (2018) have compared the current account, monetary theory and exchange rate determination. The type of their research is only an application of a model not an empirical study so there is no information about the country and the period of research. The research model proposed by the authors is about exchange rate determination through two approaches, the monetary policy approach and the current account approach. Through the monetary policy approach, it was found that there is a positive relationship between production, price, and money supply with the current account balance in the research model. Meanwhile the relationship between the exchange rate and the current account is negative. There is no policy recommendations submitted by the authors unless the need for more emphasis on government policies that directly leads to the real sector than the financial sector if the government wants to reduce the current account deficit.

Kasasbeh (2018) also indirectly has studied the relationship between money supply and the current account balance in Jordan during the period 2000-2016. This study uses a comprehensive analysis model of macroeconomic simulation and presents the discussion about domestic, foreign and joint financing and its relationship with the current account balance. The results indicate that domestic financing can reduce the current account deficit. This reduction is due to the impact on the domestic price level, domestic money supply and GDP which continues to increase due to the use of domestic financing. The author then provides recommendations in the form of the importance of diversifying funding sources, including private sector financing because it can affect the current account through the line money supply.

2.3. Gross Domestic Product (GDP)
Roy (2012) has done a study about foreign indebtedness, monetary policy and economic growth. The study was conducted in America using data from 1970-2007 with Simultaneous Equation Model (SEM) as its analysis method. The results show that GDP has a positive effect on the current account balance. It needs more attention from government. It does not mean having to abandon the economic development policy of GDP but rather to understand what factors can cause the current account balance to increase, for example due to the increase in foreign indebtedness.

Eldemerdash et al. (2014) conduct a study of current account balances and fiscal policies in developing countries that have oil production and do not have oil production. The study was conducted during the period 1975 - 2010 using the method of panel data analysis with intercept and error variances. The research variables of this study consist of gross investment, gross saving and fiscal balance. In addition, there is control variable included, namely trade openness, capital mobility, GDP growth, and oil price. The results of the study show that the GDP growth as one of the control variables has a positive significant influence on the current account balance. An increase in GDP of 1 percent can cause current accounts to increase by 0.15 percent. Other variables such as money supply, the results of study explain there is a positive relationship between money supply and the current account balance. This positive effect was found to be greater in oil-producing countries compared to in non-oil-producing countries. Therefore, for non-oil-producing countries, the authors provide recommendations to them to take positions by increasing trading volume.

2.4. Foreign Direct Investment (FDI)
Kandil (2012) has a study about the current account balance and the affecting factors. The study conducted in developed and developing countries during the period 1968–2008 using the error correction model analysis method. Independent variables in this study are national income, tax income, private consumption, private investment, government consumption, public investment and total investment. The results show that investment can give a positive influence on the development of the current account balance. Investment in developed countries is able to support the growth of the current account balance through the line of import cyclicality meanwhile investment in developing countries has the opposite result where investment actually causes imports to fluctuate. The author then provides recommendations in the form of preparing a policy strategy that can attract more investment so that the current account deficit becomes smaller.

Hoque and Rao (2016) have done a research on the current account balance in Malaysia. The study uses the ARDL method during the period 1970 - 2010. The variables of this study are exports, imports and GDP. The results explains that the Malaysian economy is still classified as a sustainable current account, as it is known that since the end of the ASEAN economic crisis until now Malaysia has always experienced a trade balance surplus. Empirical evidence from the study also found that investment has a positive effect on the current account balance position in Malaysia. The thing that needs to be done by the government is how to improve investors' perceptions of investment in Malaysia.

Kovacevic (2017) has conducted a research in 9 of the SECI (Southeast European Cooperative Initiative) countries, consisting of Bulgaria, Croatia, Romania, Moldova, Serbia, Bosnia, Herzegovina, Macedonia, Montenegro and Albania. The study was conducted during the period 2000 - 2015. The study uses panel data analysis model with the FMOLS and DOLS estimator to analyze the relationship between the current account balance and its affecting factors. The results describe that appreciation in the exchange rate can cause an inverse effect on the current account balance. Meanwhile, foreign direct investment has a positive effect on the current account balance. Positive effects are also found in private remittance. The policy recommendation offered by the author is the need to carry out structural change in order to reduce the current account balance deficit and to avoid the exchange rate appreciation of the country as much as possible (see table 1).

Table 1. Research Hypotheses

Title	Statement
Hypothesis 1 (H1)	Exchange rate has a significant negative influence towards Current Account Balance
Hypothesis 2 (H2)	Money Supply (M2) has a significant positive influence towards Current Account Balance
Hypothesis 3 (H3)	Real Gross Domestic Product (GDP) has a significant positive influence towards Current Account Balance
Hypothesis 4 (H4)	Foreign Direct Investment (FDI) has significant positive influence towards Current Account Balance

3. Research Methodology

In this study, a systematic time series econometrics approach is used to investigate the determinants of Indonesia's current account balance during 2000-2017. In order to examine the relationship between CAB and ER, M2, real GDP and FDI in Indonesia, this study uses secondary data from Central Bureau of Statistics of Indonesia (BPS Indonesia). Error Correction Model (ECM) was used to verivy short run dynamics with long run equilibrium.

The empirical model is represented by the Current Account Balance and is assumed to be affected by the rate of Exchange rate, M2, real Gross Domestic Product (GDP) and Foreign Direct Investment (FDI).

$$CAB_t = f(ER_t, M2_t, \text{real } GDP_t, FDI_t) \dots\dots(1)$$

The model becomes:

$$CAB_t = \beta_0 + \beta_1 ER_t + \beta_2 M2_t + \beta_3 \text{real } GDP_t + \beta_4 FDI_t + \varepsilon_t \dots\dots(2)$$

Description:

CAB_t = dependent variable measured by the Current Account Balance;

β_0 = intercept;

$\beta_1, \beta_2, \beta_3$, and β_4 = parameter to be estimated ER, M2, real GDP, and FDI;

ER = Exchange Rate Dollar USA

M2 = the domestic money supply that includes narrow money plus savings and time deposits,

Real GDP = real Gross Domestic Product

FDI = Foreign Direct Investment

ε = Error term

Taking the logarithm of both side of the model produces a linear equation of the form:

$$LogCAB_t = \beta_0 + \beta_1\, LogER_t + \beta_2\, LogM2_t + \beta_3\, Logreal\ GDP_t + \beta_4\, LogFDI_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

4. Research Result

4.1. Unit Root Test and Johansen Test
The resultf of the Augmented Dickey-Fuller (ADF) are presented in Table 2. These results show that are all research variables were not stationary at the level but they were stationary at the 1st difference.

Table 2. Unit Root Test Result

Variable	Probability Values	
	Level	1st difference
CAB	0.6843	0.0161**
Log(ER)	0.7789	0.0058***
Log(M2)	0.2586	0.0432**
Log(real GDP)	0.9922	0.0395**
Log(FDI)	0.82	0.0031***

* stationary at a significance value of 10%; ** of 5%; and *** of 1%.
Source: data is reprocessed by author

The unit root test results show that if all variables are stationary in the same degree, the co-integration test can be used. The Johansen test was used to determine the number of co-integration equations among the variables. The result of the Johansen test is presented in Table 3.

Table 3. Johansen Test Result

Trend assumption: Linear deterministic trend
Series: CAB LOG(ER) LOG(M2) LOG(real GDP) LOG(FDI)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.998638	205.2295	69.81889	0.0000
At most 1 *	0.960271	99.64447	47.85613	0.0000
At most 2 *	0.887980	48.03371	29.79707	0.0002
At most 3	0.454760	13.00852	15.49471	0.1145
At most 4	0.186576	3.304054	3.841466	0.0691

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.998638	105.5850	33.87687	0.0000
At most 1 *	0.960271	51.61076	27.58434	0.0000
At most 2 *	0.887980	35.02519	21.13162	0.0003
At most 3	0.454760	9.704469	14.26460	0.2321
At most 4	0.186576	3.304054	3.841466	0.0691

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level;
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: data is reprocessed by author

Based on the Johansen co-integration test above, there was co-integration, both based on the trace statistic and the max-eigenvalue statistical test at significance α = 5%. The model above describes that the results were not stationary at the level and were stationary at 1st difference and all variables were co-integrated. The existence of co-integration means that there is a relationship in short-term or there is a short-term balance (see table 4).

4.2. Short-Term ECM Analysis

Table 4. ECM in The Short-Term

Dependent Variable: D(CAB)
Method: Least Squares
Date: 01/07/19   Time: 19:52
Sample (adjusted): 2001 2017
Included observations: 17 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11329.13	13994.64	0.809534	0.4354
D(LOG(ER))	-31245.40	19452.33	-1.606255	0.1365
D(LOG(M2))	16153.41	64924.27	0.248804	0.8081
D(LOG(real GDP))	-275420.6	316048.0	-0.871452	0.4021
D(LOG(FDI))	-3486.351	7807.877	-0.446517	0.6639
ECT(-1)	-0.701365	0.278704	-2.516523	0.0287

R-squared	0.542351	Mean dependent var		-1489.235
Adjusted R-squared	0.334329	S.D. dependent var		8460.776
S.E. of regression	6903.035	Akaike info criterion		20.78787
Sum squared resid	5.24E+08	Schwarz criterion		21.08195
Log likelihood	-170.6969	Hannan-Quinn criter.		20.81711
F-statistic	2.607178	Durbin-Watson stat		2.126467
Prob(F-statistic)	0.086096			

D(CAB) =11329.13 -31245.40 D(Log(ER)) +16153.41 D(Log(M2)) -275420.6 D(Log(real GDP))

-3486.351 D (Log(FDI)) -0.701365 ECT(-1)

R-square = 0.542351   n = 17   F = 2.607178

The error correction term coefficient ECT (-1) was statistically significant, it means the ECM specification model that used in this study is valid. The coefficient value of ECT (-1) was -0.701365. It explains that the difference between the actual value of the current account and the balance is 0.701365 which will be adjusted within 1 year.

Through one-sided test, variable of D (Log(ER)) was statistically significant (the probability value was 0.06825 < $\alpha = 0.10$) and negative. It means when the exchange rate increases by 1 percent, the current account will decrease by 312,454 million US dollars. These results are consistent with the results of study by Das (2016), Gnimassoun and Mignon (2016) and Grubisic, Kamenkovic, and Zdravkovic (2018).

Das (2016) carries out a research on current account imbalances in the global economy. The study uses a dynamic panel analysis of the GMM method during the period 1980–2011 in countries that are categorized as developed, emerging, and developing countries. The results show that in developing countries the exchange rate has a negative effect and GDP also has negative effect on the current account balance, while in developed countries the exchange rate and GDP both have a positive impact on the current account balance. It explains that the factors that affect the current account balance can have different effects depending on which country is studied. In developed countries, the current account usually is surplus but in most developing countries are deficits. Policies issued to anticipate it and also the differences between developed and developing countries.

Gnimassoun & Mignon (2016) have conducted a study on three macroeconomic indicators consisting of the current account balance, gaps output and exchange rate. The study was done in 22 industrialized countries during the study period of 1980–2011. The research method uses panel data analysis of the VAR model. The results tell that each macroeconomic indicator as the research model interacts with each other through causality relationships. One of the relationships seen in the higher exchange rate will cause the current account deficit to be deeper. It means there is a significant negative relationship between exchange rate and current account balance in the 22 industrialized countries that have been studied. Therefore the policy offered by the authors to maintain the balance of the current account needs to emphasize the importance of creating internal balance through reducing the output gap and stabilizing the exchange rate.

Meanwhile, Grubisic et al. (2018) also have concluded that the fixed exchange rate regime can affect the increase in accumulated current account deficits. It means there is a significant negative relationship between the two variables. This study was carried out during the period 1999-2012 in 16 CEECs (Central and Eastern European countries). The research method uses panel data estimation model with variables consisting of fiscal policy, exchange rate and current account balance. The research recommendations from the author are in the form of the need to implement a floating exchange rate policy because it is considered more capable of creating the current account deficit stability.

M2, real GDP and FDI

Based on the results of the research in Table 4, it is evident that the variable D (Log (M2)), D (Log (real GDP)) and D (Log (FDI)) is not significant on the Indonesia's CAB because their probability value of were above $\alpha = 10\%$. It means that in the short-term M2, real GDP and FDI do not have a significant effect on CAB conditions in Indonesia during the study period (2000-2017).

However, through the F-test, all independent variables simultaneously affect the dependent variable (the probability value was 0.086096 < $\alpha = 0.10$). Then the value of R square was 0.542351 or 54.24%. It explains that the independent variable variation is able to explain the variation of the dependent variable by 54.24% and the remaining 43.76 % is explained by other variables outside the model.

4.3. Long-Term ECM Analysis

Table 5. ECM in The Long Term

Dependent Variable: CAB
Method: Least Squares
Date: 01/07/19   Time: 19:18
Sample: 2000 2017
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1065163.	1895623.	0.561907	0.5837
LOG(ER)	-10417.90	20180.90	-0.516226	0.6144
LOG(M2)	20398.79	67188.32	0.303606	0.7662
LOG(real GDP)	-62456.14	155462.3	-0.401745	0.6944
LOG(FDI)	-15406.54	7876.503	-1.956013	0.0723

R-squared	0.763767	Mean dependent var		-3341.667
Adjusted R-squared	0.691080	S.D. dependent var		14344.50
S.E. of regression	7972.756	Akaike info criterion		21.03558
Sum squared resid	8.26E+08	Schwarz criterion		21.28291
Log likelihood	-184.3202	Hannan-Quinn criter.		21.06968
F-statistic	10.50761	Durbin-Watson stat		1.082279
Prob(F-statistic)	0.000504			

$$CAB = 1065163 - 10417.90 \, Log(ER) + 20398.79 \, Log(M2) - 62456.14 \, Log(realGDP)$$
$$-15406.54 \, Log(FDI)$$

R-square = 0.763767   n = 18   F = 10.50761

Based on Table 5, it was found that in the long-term only Log (FDI) was statistically significant with one-sided test (0.03615<0.05) and negative. It means when FDI increases 1 percent, the current transaction will decrease by 154.06 million US dollars. Meanwhile, the other variables consisting of Log (ER), Log (M2) and Log (real GDP) proved to be insignificant towards CAB because the probability value of ER, M2, and real GDP were above $\alpha = 10\%$. The results are in line with the results of the study by Salman and Feng (2009); Jaffri, Asghar and Asjed (2012); Khan and Saeed (2012); and Kikerkova, Naumvoska, Toshevska-Trpchevska and Disoska (2018).

The results of this study are in line with the findings of the study of Salman and Feng (2009). They explains that FDI has a significant negative effect on the current account balance. The research was carried out in Pakistan during the period 1971-2005 using the impulse response function and Granger causality methods. Their results show that foreign investment has a negative impact on the current account balance and at the same time has a positive impact on economic growth. Foreign direct investment (FDI) is considered to cause a deficit in the current account but can increase economic growth. It will attract other foreign investment and cause account deficits to be wider in the future.

Jaffri et al. (2012) also found the same conclusion. Their study tell that FDI can have a negative influence on the current account balance. It was conducted in Pakistan using data from 1983–2011 with the method of autoregressive distributed lag. Their research variables are FDI as an independent variable and current account balance, income outflows as dependent variables. The results show that an increase in FDI turned out to cause a decrease in the current account balance, on the contrary it could increase income outflows. The negative effect also occurs in both long-term and short-term ECM calculations. As an implication of the policy, researchers

suggested to the government to immediately promote the importance of domestic investment and domestic savings compared to foreign savings. Moreover, if the foreign investment cannot be dammed, the government needs to diversify from the existing sectors to become more diverse, especially in the service sector.

The study by Khan and Saeed (2012) uses current account balance, budget deficits, foreign investment as their research variables. The study was conducted in Pakistan during the period 1976-2010 using the autoregressive distributed lag bound testing method. The results of the study show that both in the long-term and in the short-term, foreign investments are able to have a significant negative effect on the current account balance. The coefficient of foreign investment in long-term is found greater than the coefficient of forein investmen in short-term. It describes the high mobility of capital inflows in Pakistan which can cause the current account balance deficit to be lower.

Kikerkova et al. (2018) conduct a research about the effect of FDI on economy in Republic of Macedonia. Their study uses vector error correction model (VECM) methods during the period 2003-2015. One of the research results shows that FDI has a significant negative relationship on the current account balance in the long-run. An increase in foreign investment can cause a wider current account deficit through import purchases on the company's production equipment. The researchers give recommendations to the government to always ensure credibility and political stability in order to attract more foreign investment, and the use of FDI is directed to produce export-oriented products and reduce imports so that macroeconomic conditions especially CAD can be better.

Using the F-test, all independent variables simultaneously affect the dependent variable (the probability value was $0.000504 < \alpha = 0.05$). While the value of R-square was 0.763767 or 76.38 percent, it means the independent variable variation is able to explain the variation of the dependent variable by 76.38 percent, then the remaining 23.62 percent is explained by other variables outside the model.

5. Discussion

Based on the result of the study in the short-term, it can be seen that the exchange rate has a negative effect on the current account with coefficinet of -31245.404, it means when the exchange rate increases by 1 percent, the current account balance (CAB) will decrease by 312.454 million US dollars. It explains that the rupiah has depreciated, especially against the US dollar which is used as the dominant currency of Indonesian export-import transaction needs. When the rupiah currency depreciates, it will cause the price of Indonesian exported goods to be cheaper but on the other hand there will be an increase in the price of imported goods. The cheaper prices of exported goods should lead to increasing competitiveness of Indonesian goods in the global market. Nevertheless to be remembered, the imported raw materials for producing Indonesian exported goods are still high. As a result, despite the depreciation of the rupiah, it cannot encourage the competitiveness of Indonesian exports in the global market because it is constrained by dependence on imported raw materials whose their prices are expensive. The high cost of imported raw materials will cause production costs to be more expensive and reduce the competitiveness of Indonesian export products. It causes Indonesia's current account tend to deficits due to the weak product exports to the global market because the relatively higher selling prices compared to competitors' products and then it causes a weakening of the competitiveness of Indonesia's export products on the world market.

Beside of that, the reduced competitiveness of Indonesian exports also occurs due to the rapid adjustment of domestic prices which were too high due to the depreciation of the rupiah against the US dollar. It happens due to inflation through imported inflation of imported capital goods, raw materials and intermediary raw materials for domestic production activities. As it is known that the products are produced by companies in Indonesia are still very dependent on imports. In addition, this result is also influenced by the depreciation of the rupiah exchange

rate, which in the short term will have a negative impact on the current account to a deficit (Current Account Deficit).

Theoretically in the long-term as Marshall-Lerner theory and the effect of J-curve, the depreciation of the rupiah exchange rate should have a positive impact on CAB, provided the conditions of the foreign exchange market are stable. But in reality, the condition of the foreign exchange market in Indonesia is not stable, as evidenced by very high fluctuations in the rupiah exchange rate against foreign exchange during this study. As a result, improvements in Indonesia's CAD did not occur because the exchange rate did not have a significant effect on Indonesia's current account.

The results of this study are in line with the results of a study by Endegnanew, Turner-Jones and Yartey (2012) about the effect of policies on real effective exchange rate on the current account. Their results prove that the real effective exchange rate does not have a significant effect on the current account. The study was conducted in 155 countries during the period 1970-2009 where 42 countries were classified as microstates. The study used a panel data analysis model and vector auto-regression (VAR). The study results show that for countries with micro state categories, there is a significant lack of relationship between the real effective exchange rate and the current account. It makes researchers offer recommendations to state governments to focus on efforts to minimize the impact of fiscal policies on current account balance positions in their countries.

The relationship between the money supply (M2) both in the short and long term does not affect Indonesia's current account. M2 has no effect due to the component of M2 which is dominated by deposits and savings so it does not affect on Indonesia's the current account balance (CAB). Less liquid the deposits and savings than the cash, causing deposits and savings cannot play a role (insignificant) in encouraging exports and imports of goods and services in Indonesia which rely more on liquid payment instruments or cash.

In the short and long term, GDP also does not affect the current account. It can be explained that Indonesia's GDP over the past ten years has been dominated by the sector of household consumption expenditure (C), not the export sector of goods and services or the import of goods and services, so that it causes no effect on the current account. Component C reaches around 55% of expenditure in Indonesia's GDP, while export imports only range from 20%.

In the short term, FDI does not affect the current account. The entry of FDI into Indonesia in the short term does not affect the current account because FDI is mostly used for investment in imported substitute products which still rely on imported raw materials. It takes time to import raw materials and produce these products so that it does not affect Indonesian CAB in the short term.

However in the long term, it can be seen that FDI has a negative effect on the current account with an elasticity value of 154.06, it means when FDI increases by 1 percent, the current transaction will decrease by 154.06 million US dollars. This is due to FDI is needed to produce imported goods (import substitution) but the import component to produce imported substitutes is still dominant. As a result, the value of the current account in Indonesia then declined and even reached the current account deficit. In addition, the increase in the current account deficit (CAD) could also be caused by a decline in the surplus in the balance of trade of goods that continues to occur because an increase in imports due to the strengthening of Indonesia's need for investment that surpassed exports which was accompanied by an increase in the service balance deficit.

Conclusions

The results show that (a) in the short-term: M2, real Gross Domestic Product (GDP), and FDI have not significant effects on Indonesia's Current Account Balance. But the exchange rate has a significant negative effect on

Indonesia CAB. (b) In the long-term: Exchange rate, M2, and real Gross Domestic Product (GDP) have a significant effect on Indonesia's Current Account Balance. On the other hand, FDI has a negative significant effect on Indonesia's Current Account Balance.

Policy recommendations in overcoming this problem, the government needs to minimize the negative effects of factors that exacerbate Indonesia's CAB and increase factors that can reduce CAD Indonesia. First, the government needs to pay attention to the effect of exchange rate on Indonesia's current account, both short and long term. The government needs to pay attention to the fluctuations in exchange rates that occur and try to take serious efforts to stabilize or minimize fluctuations in exchange rates that occur by influencing the market of forex effectively and efficiently.

Second, the government needs to improve the investment climate and issue incentive policies for local investors, so as to maximize the exploration of sources of funding from local investors so as not to depend on outside investors. It can be done with a policy of providing incentives to institutions that have large funds such as pension funds and insurance to place their investments in government bonds and sukuk.

Third, the government must increase export-oriented product competitiveness and reduce import dependence. The trade balance deficit caused by exports of goods lower than imports, it will burden and encourage CAD. Policies that can encourage the competitiveness of export products in the global market must continue to be carried out so that it will open opportunities for increasing the value of Indonesian exports.

The limitation of this study is that the research was only conducted among 33 provinces in Indonesia for 18 years. For the next research, it can be done in 34 provinces in Indonesia with longer research time so that more complete studies can be obtained. In addition, the next study can add other independent variables that can affect Indonesia's CAD such as inflation and budget deficit so that it is more comprehensive.

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